

Amendments to the Specification:

On page 1, line 2, after the Title; please insert the following headings and paragraphs:

CROSS-REFERENCE TO RELATED APPLICATION

5 This application is a national phase filing, under 35 U.S.C. §371(c), of International Application No. PCT/DK2005/000148, filed March 4, 2005, the disclosure of which is incorporated herein by reference in its entirety.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

10 Not Applicable

BACKGROUND OF THE INVENTION

Please replace the paragraph beginning at page 1, line 9 with the following rewritten para-

15 graph:

A number of structural or building systems exists such as house buildings, including horizontal divisions, doors, windows, fire shieldings, structures of ships, including deck divisions, divisions between shutters, doors, windows and fire shieldings, etc. which serve the purpose of physically separating the one side of the structural element or elements from the 20 opposite side and for preventing [[that]] a fire, provided that a fire should occur on the one side of the structural element or elements, be transmitted to the other side of the element or elements. Conventionally, structural elements of this kind are built from steel or include a steel component which is fixated to a supporting structure or another structural element by means of a high temperature resistant and thermal insulating elements such as a high tem- 25 perature resistant pultruded body, i. e. a body made from a high temperature resistant resin and including high strength and high stiffness fibres fibers such as glass fibres fibers, fibres fibers, Kevlar KEVLAR fibres fibers, etc. The high temperature resistant body made from e. g. epoxy, phenol, fire retarded polyester resin and including glass fibres fibers may stand exposure to temperatures above 1000° C and have been used extensively within the field of fire- 30 resistant structures, such as fire-resistant doors and the like. Examples of fire- resistant doors per se are described in US 6, 434, 899, US 6, 615, 544, US 4, 811 538, US 4, 364, 987 and

GB 8630463 and reference is made to these US patents which are further incorporated in the present specification by reference.

Please replace the paragraph beginning at page 1, line 29 with the following rewritten paragraph:

5 A modern fire-resistant structure may include a high temperature resistant pultruded body which separates the two sides of the fire-resistant structure from one another as the one side being made from steel, ~~aluminium~~ aluminum or similar high temperature resistant metal material is fixated to one flange part of the high temperature resistant pultruded body and the other side also being made from steel or another high temperature resistant metallic material

10 is fixated to another flange part of the high temperature resistant body. The interior of the fire-resistant structure is conventionally filled with a fitting of thermal insulating and high temperature resistant materials such as ~~fibres~~ fibers made from rock, glass or similar material.

On page 3, after line 13, please insert the following heading:

15 SUMMARY OF THE INVENTION

Please replace the paragraph beginning at page 3, line 21 with the following rewritten paragraph:

It is an advantage of the present invention that the separation between structural elements or between a structural element and a supporting structure may be obtained using and utilising utilizing the inherent advantages of pultruded bodies as to high strength and high stiffness, low weight, high temperature resistance, etc. and at the same time eliminate or reduce the temperature gradient caused bending of the structural element when exposed to the specific high temperature and consequently without deteriorating the support of the structural element.

Please replace the paragraph beginning at page 3, line 29 with the following rewritten paragraph:

The above object, the above advantage together with numerous other objects, advantages and features which will be evident from the below detailed description of the present invention are according to a first aspect of the present invention obtained by a method of preventing or reducing temperature gradient caused bending of a structural element made of a material capable of withstanding heating to a specific temperature for an extended period of time, when heating the element to the specific temperature, the structural element being connected to an adjacent supporting structural element through a high temperature resistant supporting body, comprising the steps of providing the structural element, providing the high temperature resistant supporting body as a pultruded profiled body including a solidified high temperature resistant resin and reinforcing fibres fibers at least a part of which being constituted by fibres fibers exhibiting high strength and high stiffness at a low temperature and a reduced strength and reduced stiffness when exposed to and possibly deteriorated at the specific temperature and fixating the structural element relative to its supporting structure by means of the pultruded body.

15 Please replace the paragraph beginning at page 4, line 12 with the following rewritten paragraph:

According to the basic teachings of the present invention, the structural supporting high temperature resistant pultruded body includes a part of fibres fibers which are not stable at the specific temperature and which are softened or alternatively deteriorated at the specific 20 temperature thereby weakening the supporting pultruded body.

Please replace the paragraph beginning at page 4, line 18 with the following rewritten paragraph:

The reinforcing fibres fibers may specifically comprise a first part constituted by high strength, high stiffness and high temperature stable fibres fibers such as glass fibres fibers, 25 carbon fibres fibers, Kevlar KEVLAR fibres fibers capable of withstanding heating to the specific high temperature and a second part such as polymer fibres fibers, natural fibres fibers, e. g. polymer fibres fibers made from PE, PP, PVC or similar materials or combinations thereof, or alternatively natural fibres fibers such as fibres fibers made from plants, trees, etc. or fibres fibers made from glass, carbon fibres fibers or similar high strength and high stiffness fibres fibers provided with an outer polymer coating such a PE, PP or PVC coating.

Please replace the paragraph beginning at page 4, line 27 with the following rewritten paragraph:

The fibres fibers causing the weakening of the supporting pultruded body, i. e. the above- mentioned second part of the fibres fibers, may be evenly distributed within the resin 5 or alternatively be located at specific zones for establishing a specific weakening zone or a bending zone rather than providing an overall weakening of the supporting pultruded body. The location of the fibres fibers which cause the weakening of the supported body when exposed to the elevated high temperature may further be symmetrical or asymmetrical within the pultruded body as an asymmetrical location may cause one side of the pultruded body to 10 be weakened and thereby causing a one side deformation of the body rather than an overall weakening and a deformation of the pultruded body when exposed to the specific elevated temperature. Provided that one or more zones [[be]] are located within the pultruded supporting body, a central deformation or a central deformation zone may be obtained, provided that the zones [[be]] located at the centre center of the pultruded body.

15 Please replace the paragraph beginning at page 5, line 23 with the following rewritten paragraph:

The above object, the above advantage together with numerous other objects, advantages and features which will be evident from the below detailed description of the present invention are according to a second aspect of the present invention obtained by a pultruded 20 body comprising a resin body including a solidified high temperature resistant resin and reinforcing fibres fibers at least a part of which being constituted by fibres fibers exhibiting high strength and high stiffness at a low temperature and a reduced strength and a reduced stiffness when exposed to and possibly deteriorated at said specific temperature.

25 Please replace the paragraph beginning at page 6, line 5 with the following rewritten paragraph:

Finally, according to a third aspect of the present invention, a method of producing a pultruded body according to the above second aspect of the present invention is provided which method comprises the steps of providing reinforcing fibres fibers at least a part of which being constituted by fibres fibers exhibiting high strength and high stiffness at a low 30 temperature and a reduced strength and reduced stiffness when exposed to and possibly de-

riated at the specific temperature, providing a resin and producing the body from the reinforcing fibres fibers and the resin in a pulltrusion pultrusion process for providing the pultruded body and curing the pultruded body at a temperature without deteriorating the at least part of the fibres fibers.

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Please replace the paragraph beginning at page 6, line 15 with the following rewritten paragraph:

Basically, the method of producing the pultruded body according to the second aspect of the present invention and in itself constituting a third aspect of the present invention basically constitutes a conventional pultrusion technique involving the positioning of the fibres fibers characteristic of the present invention exhibiting the feature of providing a high strength, high stiffness and high stable pultruded body at tow temperatures such as temperatures below 100° C and allowing the pultruded fire- resistant body to be bent or otherwise deformed or eliminating or substantial reducing the temperature gradient caused bending by the simple melting of the fibres fibers provided polymer fibres fibers be used or alternatively through deterioration such as through burning or decomposition provided certain polymer fibres fibers or natural fibres fibers be used.

On page 6, after line 25, please insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

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Please replace the paragraph beginning at page 7, line 14 with the following rewritten paragraph:

Fig. 6 is a diagrammatic view illustrating the effect of substituting high strength and

high stiffness fibres fibers of a pultruded body for allowing the pultruded body to be extended

25 when exposed to heat, and

On page 7, after line 17, please insert the following heading:

DETAILED DESCRIPTION OF THE INVENTION

Please replace the paragraph beginning at page 8, line 7 with the following rewritten para-

30 graph:

For preventing the temperature gradient caused bending of the structural element 10, the thermal insulating and structural supporting elements of the structural element according to the teachings of the present invention provided with certain zones which are weakened when exposed to the extreme heating such as a heating to a temperature of 800°-1000° C. In a 5 conventional fire-resistant structural element, e. g. a door or a wall, the two metallic faces constituting the side walls of the fire-resistant structural element are interconnected by a non-thermal transmitting or heat insulating pultruded body serving to reduce the thermal transmission of heat from the hot side to the cold side. As a conventional high strength, high stiffness and high temperature resistant pultruded body includes solid glass fibres fibers, carbon fibres 10 fibers or Kevlar KEVLAR fibres fibers, the pultruded body maintains its high strength and high stiffness even at the extreme temperatures to which the body may be exposed when included in a fire-resistant the structural element which is exposed to fire at the one side such as a heating to a temperature of 800°-1000° C. In order to allow the two metallic leaves or walls 15 of the structural element to be shifted relative to one another and consequently eliminating or to a substantial extent reducing the temperature gradient caused bending of the fire-resistant structural element, the thermal insulating and supporting pultruded body of the fire-resistant wall is according to the teachings of the present invention constituted by a pultruded, profiled body which includes apart from the high strength, high stiffness and high thermal stable glass fibres fibers, carbon or Kevlar KEVLAR fibres fibers, fibres fibers such as polymer fibres 20 fibers and natural fibres fibers which are melted or deteriorated when exposed to the extreme high temperature of e. g. 800°-1000° C.

Please replace the paragraph beginning at page 8, line 31 with the following rewritten paragraph:

Throughout the various figures, elements or components, serving the purpose as elements or components respectively described above, however, having a different geometrical configuration are designated the same reference numerals, however added a marking for identifying the geometrical difference. As indicated in Figs. 2a- 2d, the meltable or deterioratable fibres fibers may be positioned in certain zones, as in Fig. 2a, wherein a profiled pultruded body 20 includes a resin core 22 in which strips of reinforcing webs or reinforcing 25 fibres fibers 24 are included together with two zones 26 including polymer or natural fibres and providing fibers that provide a weakening of the profiled body 20 in these specific zones, 30

provided that the profiled body 20 [[be]] is heated to a temperature above the melting point or alternatively the decomposition or burning temperature of the fibres fibers included in the two zones. The provision of the zones may be changed for obtaining a specific bending capability as is illustrated in the embodiments 2a-2d.

5 Please replace the paragraph beginning at page 9, line 11 with the following rewritten paragraph:

In Fig. 2b, the profiled pultruded body 20' includes a major central zone 26' in which a large amount of polymer fibres fibers or similar fibres fibers providing weakening within the zone 26' provided the profiled pultruded body 20 be exposed to a temperature above the 10 melting point of the polymer fibres fibers.

Please replace the paragraph beginning at page 9, line 16 with the following rewritten paragraph:

In Fig. 2c, a multitude of zones [[26]]26" are provided within the resin 22 of the profited, pultruded bode 20" and at the same time, the reinforcing webs or fibres fibers 24 are 15 omitted. In Fig. 2d, a further elaborated structure is shown as the profiled pultruded body 20" includes the resin core 22 in which three weakening zones 26" are provided. As a sandwich enclosing the resin core 22, two layers 23 are provided. The layers 23 may include a high amount of high strength, [[hifh]] high stiffness and high temperature stable fibres fibers, such as glass fibres fibers, carbon fibres fibers or Kevlar KEVLAR fibres fibers and furthermore, the profiled pultruded pultruded body 20" includes two end profiled parts 27 enclosing the outer ends of the shallow body composed of the two sandwiching layers 23 and the central resin core 22. The element elements 27 may be made from resin material or alternatively may be constituted by metallic end caps which are machined to the profiled pultruded body 20" after the completion of the pultrusion process.

25 Please replace the paragraph beginning at page 9, line 29 with the following rewritten paragraph:

In Fig. 3, a perspective view of a profiled pultruded body according to the present invention is shown including a glass fibre fiber reinforced resin 22 encircling a central weakening zone 26^{IV}.

Please replace the paragraph beginning at page 10, line 1 with the following rewritten paragraph:

In Fig. 4 a ~~pultrusion~~ pultrusion apparatus 40 is shown comprising a receiving section 46 in which webs of ~~fibres~~ fibers reinforcing materials are introduced which webs are 5 shown in the left-hand part of Fig. 4 and two of which are designated the reference numeral 42. In Fig. 4, the reference numeral 44 designates three supplies of high strength, high stiffness and high temperature stable ~~fibres~~ fibers such as glass ~~fibres~~ fibers, carbon ~~fibres~~ fibers or Kevlar-KEVLAR ~~fibres~~ fibers which are also introduced into the receiving section 46 of pultrusion apparatus 40. Apart from the high strength, high stiffness and high temperature 10 stable supplied from the supplies 44, reinforcing ~~fibres~~ fibers such as polymer ~~fibres~~ fibers or natural ~~fibres~~ fibers are further supplied to the receiving section 46 from a reservoir 43 shown in the top part of Fig. 4 which ~~fibres~~ fibers serve as reinforcing ~~fibres~~ fibers and provide high strength and high stiffness at a low temperature such as a temperature below 100° C and which ~~fibres~~ fibers are melted or deteriorated when exposed to an elevated temperature such 15 as a temperature of 900°-1000° C. From the receiving section 46, a string 48, including the webs 42, the high strength, high stiffness and high temperature stable ~~fibres~~ fibers from the supplies 44 and further the ~~fibres~~ fibers supplied from the reservoir 43 are introduced into a resin applicator and resin heating and curing apparatus 50 communicating with a resin reservoir through a pipe 52 for the supply of resin thereto. An output die of the apparatus 50 is 20 designated the reference numeral 54 and provides a specific ~~eonfigurated~~ configured shaping of the of a ~~pultrusion~~ pultrusion string 56 delivered from the apparatus 50 which string 56 is introduced into two puller apparatuses 58 for pulling the ~~pultrusion~~ pultrusion string from the die 54 of the apparatus 50. From the puller 58, the string 56 is delivered to a cutter 60 which separates the string 56 into distinct sections.

25 Please replace the paragraph beginning at page 11, line 4 with the following rewritten paragraph:

In Fig. 6, two graphs are shown, each illustrating the extension of the profiled pultruded body according to the present invention such as the body 20^{IV} shown in Fig. 3 when exposed to a load and when not heated and when heated, respectively. The one graph designated 'no heat' represents the extension of the profiled pultruded body when not exposed to 30 heating, and the other graph designated 'with heat' represents the extension of the profiled

pultruded body when exposed to heat such as heating to a temperature of above 500° C. As is evident from Fig. 6, the profiled pultruded body is allowed to extend to a higher degree when heated, thereby allowing the structural element including the profiled pultruded body to ~~minimise~~ ~~minimize~~ or eliminate temperature gradient caused bending of the structural element. When heated, the structural body has a lower shear modulus which allows the structural body to elongate more freely due to the heating thus ~~minimising~~ ~~minimizing~~ the temperature gradient caused bending of the structural element.

Please replace the paragraph beginning at page 11, line 18 with the following rewritten paragraph:

10 In Fig. [[6a]] 6A a detail of the diagrammatic view of Fig. 6 is shown, illustrating in greater details the first part of the two curves shown in Fig. 6. The detail of Fig. [[6a]] 6A shows that the 'no heat' graph is steeper than the 'with-heat' graph, and also shows that the 'no heat' graph is positioned above the 'with-heat' graph.

15 Please replace the paragraph beginning at page 11, line 25 with the following rewritten paragraph:

20 A prototype embodiment of the profiled pultruded body 20^{IV} shown in Fig. 3 is made from the following components: The resin was phenol, the high strength, high stiffness and high temperature stable ~~fibres~~ ~~fibers~~ were glass ~~fibres~~ ~~fibers~~, the bending zone generating ~~fibres~~ ~~fibers~~ were polymer ~~fibres~~ ~~fibers~~ of polyester. The profiles measured: 31 mm width, 50 mm height and [[2,6]] 2.6 mm thickness. The prototype version of the profiled pultruded body 20^{IV} was used for the measurements illustrated in Fig. 6.